

What is claimed is:

- 1 1. A method of forming a substrate, the method comprising:
2 applying a resist to a back side of a substrate having patterned conductive
3 layers on a front side and the back side of the substrate;
4 removing part of the patterned conductive layer from the front side of the
5 substrate to form pads and interconnects on the front side of the substrate;
6 applying another resist to the front side of the substrate;
7 forming a pattern in each resist that exposes the pads on the front and back
8 sides of the substrate; and
9 applying electrolytic nickel to the pads on the substrate.
- 1 2. The method of claim 1 further comprising applying gold to the electrolytic nickel
2 on the pads by plating.
- 1 3. The method of claim 1 further comprising:
2 removing the resist from the back side of the substrate; and
3 removing a part of the conductive layer from the back side of the substrate to
4 form pads and interconnects on the back side of the substrate.
- 1 4. The method of claim 3 further comprising:
2 applying a further resist to the back side of the substrate; and
3 forming a pattern in the resist that exposes the pads on the back side of the
4 substrate.
- 1 5. The method of claim 4 further comprising applying gold to the electrolytic nickel
2 on the pads that are within the pattern of at least one of the resists on the front and
3 back sides of the substrate.

1 6. The method of claim 4 further comprising forming solder on the pads that are
2 within the pattern of at least one of the resists on the front and back sides of the
3 substrate.

1 7. The method of claim 1 wherein applying electrolytic nickel to the pads on the
2 substrate includes applying electrolytic nickel to the pads on one of the front and
3 back sides of the substrate.

1 8. A method of forming a substrate, the method comprising:
2 applying a conductive layer to one side of a substrate that includes pads and
3 interconnects on both sides of the substrate;
4 applying a resist to both sides of the substrate;
5 forming a pattern in each resist that exposes the pads on both sides of the
6 substrate; and
7 applying electrolytic nickel to the pads on the substrate.

1 9. The method of claim 8 further comprising applying gold to the electrolytic nickel
2 on the pads by plating.

1 10. The method of claim 8 wherein applying electrolytic nickel to the pads on the
2 substrate includes applying electrolytic nickel to the pads on one of the front and
3 back sides of the substrate.

1 11. The method of claim 8 further comprising:
2 removing the resist from the side of the substrate that includes the
3 conductive layer; and
4 removing a part of the conductive layer from the substrate to redefine the
5 pads and interconnects on the side of the substrate that were joined by the
6 conductive layer.

1 12. The method of claim 11 further comprising:
2 applying a resist to the side of the substrate that had included the conductive
3 layer; and
4 forming a pattern in the resist to expose the pads on the side of the substrate
5 that had included the conductive layer.

1 13. The method of claim 12 further comprising applying gold to the electrolytic
2 nickel on the pads that are within the pattern of at least one of the resists on the
3 substrate.

1 14. The method of claim 13 further comprising forming solder on the pads that are
2 within the pattern of at least one of the resists on the substrate.

1 15. A method of forming a substrate, the method comprising:
2 applying a conductive layer to a front side and a back side of a substrate;
3 applying a first resist to the front side of the substrate and a second resist to
4 the back side of the substrate;
5 forming patterns in the first resist and the second resist;
6 applying conductive material within the pattern of the first and second resists
7 to the conductive layer;
8 removing the first and second resists from the front and back sides of the
9 substrate;
10 applying a third resist to the back side of the substrate;
11 removing part of the conductive layer from the front side of the substrate to
12 form pads and interconnects on the front side of the substrate;
13 applying a fourth resist to the front side of the substrate;
14 forming patterns in the third and fourth resists to expose the pads on the
15 front and back sides of the substrate;
16 applying electrolytic nickel to the pads on the substrate;

17 removing the third resist from the back side of the substrate;
18 removing a part of the conductive layer from the back side of the substrate to
19 form pads and interconnects on the back side of the substrate;
20 applying a fifth resist to the back side of the substrate; and
21 forming a pattern in the fifth resist that exposes the pads on the back side of
22 the substrate.

1 16. The method of claim 15 further comprising applying gold to the electrolytic
2 nickel on the pads by plating before the conductive layer is removed from the back
3 side of the substrate.

1 17. The method of claim 15 further comprising applying gold to the electrolytic
2 nickel on the pads that are within the pattern of at least one of the third and fifth
3 resists.

1 18. The method of claim 15 wherein applying a conductive layer to a front side and
2 a back side of a substrate includes applying a copper layer to a front side and a back
3 side of a substrate.

1 19. The method of claim 15 further comprising forming solder on the pads that are
2 within the pattern of at least one of the third and fifth resists.

1 20. The method of claim 15 wherein applying electrolytic nickel to the pads on the
2 substrate includes applying current to the substrate while the substrate is immersed
3 in an electrolyte that includes nickel ions.

1 21. A method of forming an integrated circuit assembly, the method comprising:
2 applying a resist to a back side of a substrate that includes patterned
3 conductive layers on a front side and a back side of the substrate;
4 removing part of the patterned conductive layer from the front side of the
5 substrate to form pads and interconnects on the front side of the substrate;
6 applying another resist to the front side of the substrate;
7 forming a pattern in each resist that exposes the pads on the front and back
8 sides of the substrate;
9 applying electrolytic nickel to the pads on the substrate;
10 forming solder on the pads that are within the pattern of at least one of the
11 resists on the front and back sides of the substrate; and
12 coupling an electronic component to the solder in the pads on one the front
13 and back sides of the substrate.

1 22. The method of claim 21 wherein attaching an electronic component to the pads
2 on one the front and back sides of the substrate includes attaching a die to the pads
3 on the front side of the substrate.

1 23. The method of claim 22 wherein attaching an electronic component to the pads
2 on one the front and back sides of the substrate includes attaching a board to the
3 pads on the back side of the substrate.

1 24. The method of claim 21 further comprising applying gold to the electrolytic
2 nickel on the pads by plating before forming solder on the pads.

1 25. The method of claim 21 wherein the electronic component is a processor.

1 26. The method of claim 21 wherein the electronic component is a wireless
2 transceiver.

1 27. The method of claim 21 wherein forming solder on the pads comprises:
2 removing the resist from the back side of the substrate;
3 removing a part of the conductive layer from the back side of the substrate to
4 form pads and interconnects on the back side of the substrate;
5 applying another resist to the back side of the substrate; and
6 forming a pattern in the another resist that exposes the pads on the back side
7 of the substrate.

1 28. A computer system comprising:
2 a bus;
3 a memory coupled to the bus;
4 an integrated circuit assembly that is electrically connected to the bus, the
5 integrated circuit assembly including a substrate formed by a process that includes:
6 applying a resist to a back side of the substrate when the substrate
7 has patterned conductive layers on a front side and the back side of the
8 substrate;
9 removing part of the patterned conductive layer from the front side of
10 the substrate to form pads and interconnects on the front side of the
11 substrate;
12 applying another resist to the front side of the substrate;
13 forming a pattern in each resist that exposes the pads on the front and
14 back sides of the substrate; and
15 applying electrolytic nickel to the pads on the substrate.

1 29. The computer system of claim 28, wherein the process that forms the
2 substrate further includes applying gold to the electrolytic nickel on the pads.

1 30. The computer system of claim 28, wherein the process that forms the
2 substrate further includes forming solder on the pads.